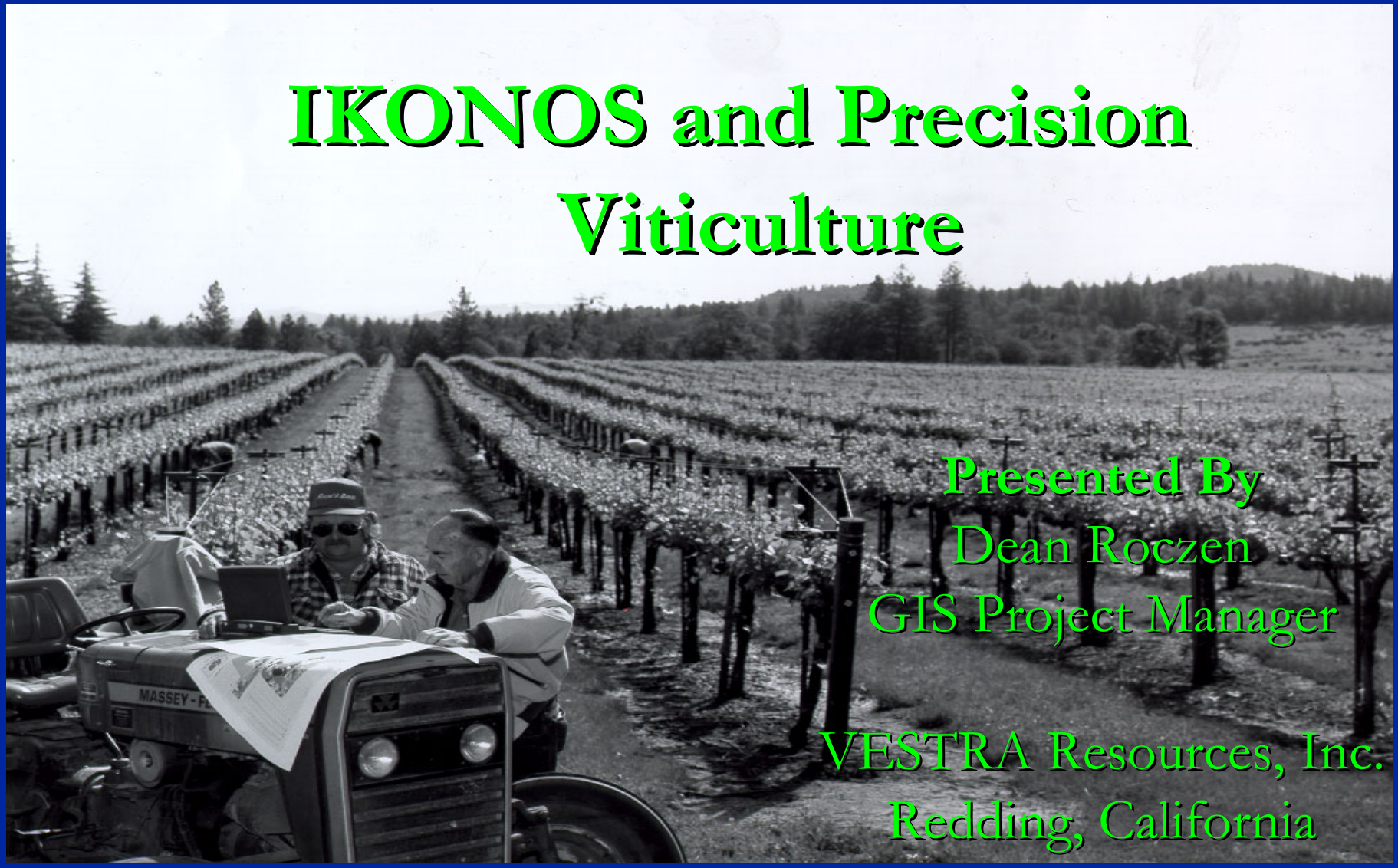
IKONOS and Precision Viticulture



Presented By

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Redding, California

IKONOS and Precision Viticulture

VESTRA

VINTAGE – what is it ?

- **V**iticultural
- **I**ntegration of **N**ASA
- **T**echnologies for
- **A**ssessment of the
- **G**rapevine **E**nvironment

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Collaborators:

California State University Monterey Bay

Ames Research Center

VESTRA

ROBERT MONDAVI

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Sponsors:

NASA Food & Fiber Applications of Remote Sensing Program (#NAG13-99020)

NASA Scientific Data Purchase (Task #460)

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VINTAGE – Goals

- **"Adapt and promote *NASA-developed* scientific methods and technologies as tools for *site-specific* and regional crop stress management",**

- **"…using the premium wine industry as a testbed."**

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Vineyards currently use Imagery Products

- Commercially available sources
- Normalized Difference Vegetative Index (NDVI)
- Incorporated into GIS implementations

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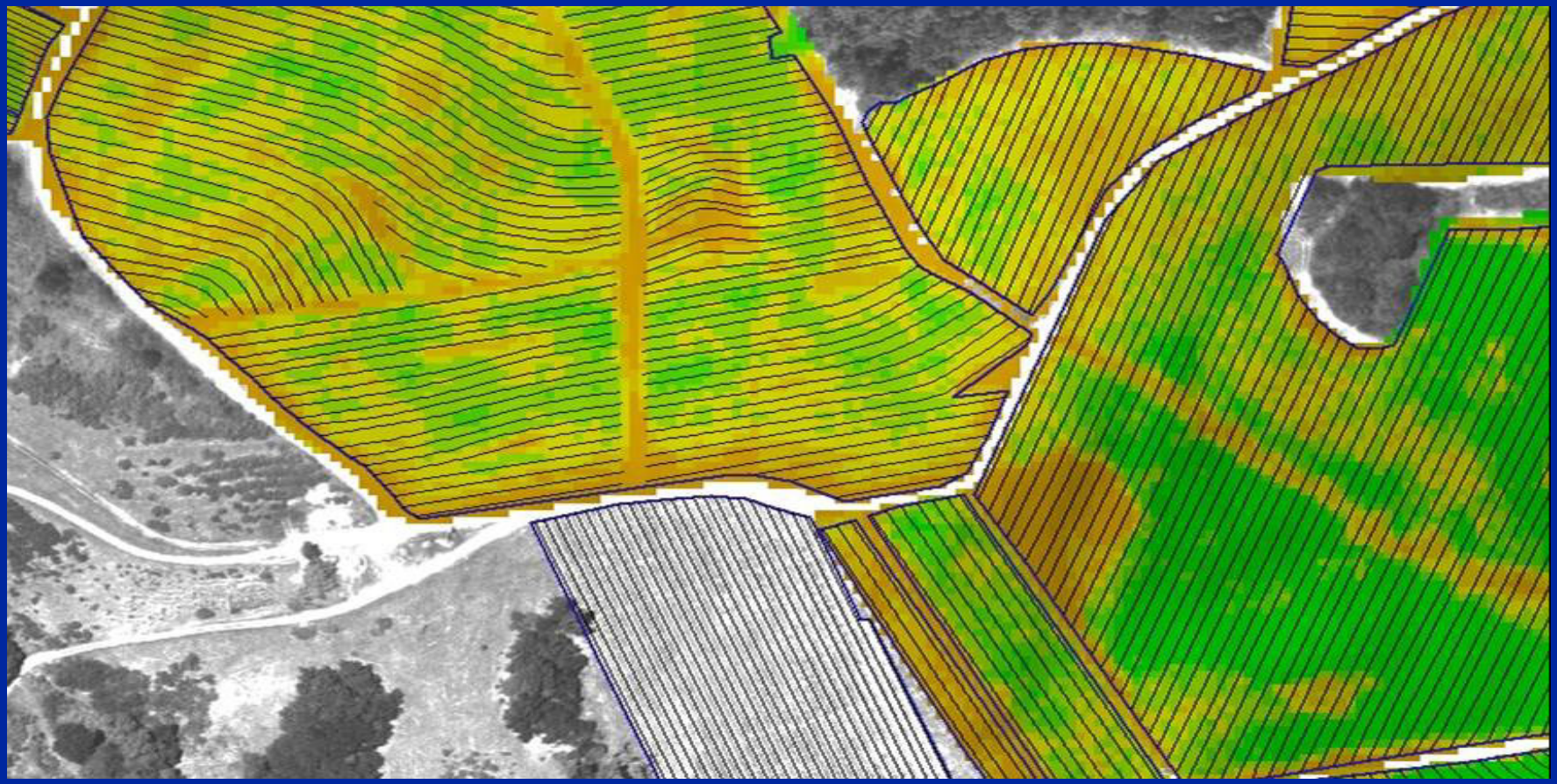
NDVI – unit-less measure of wavelength reflectance that characterizes vigor



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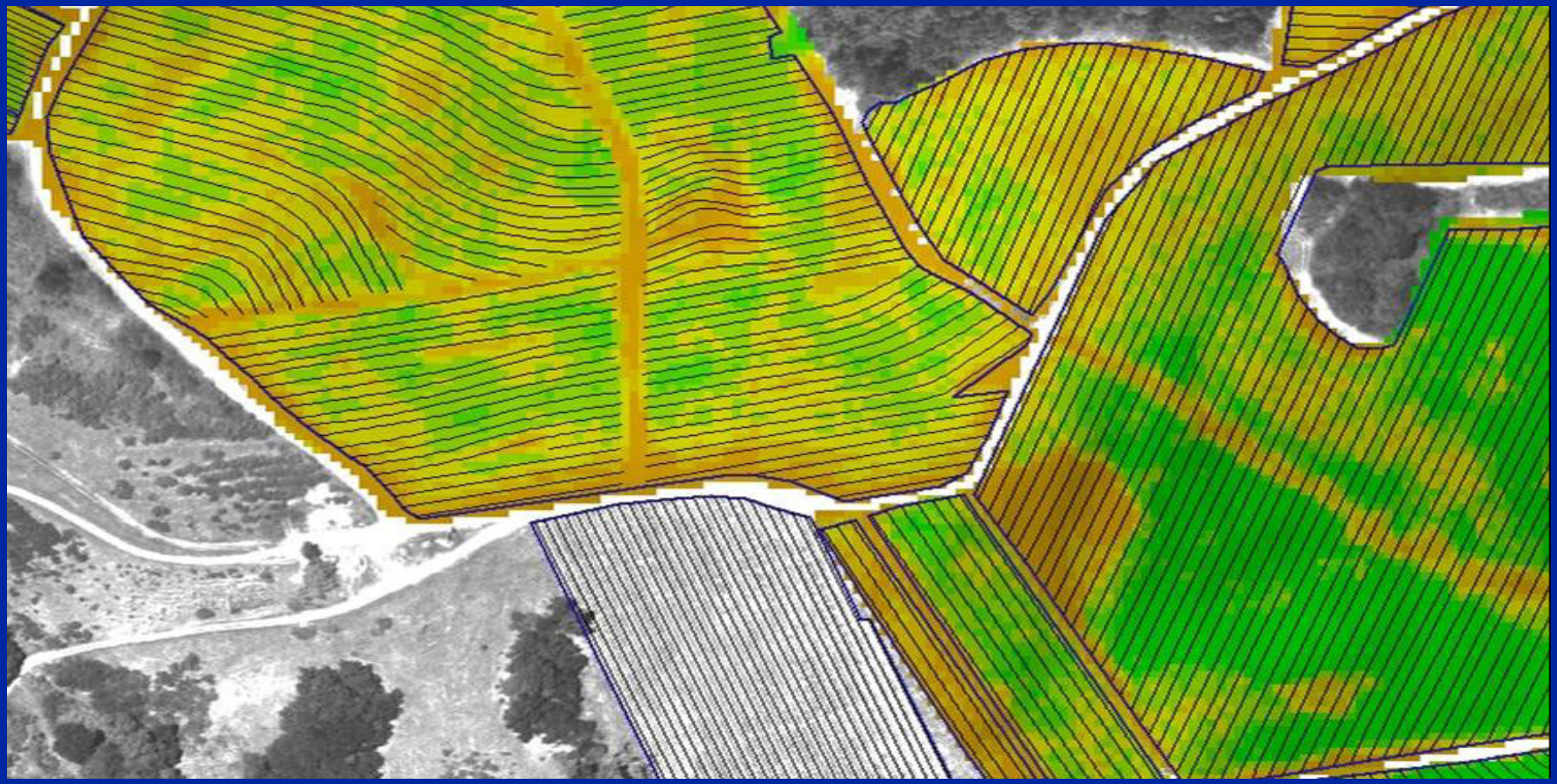
NDVI – values are not directly usable to vineyard managers



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VESTRA

Purpose of VINTAGE study

- Leaf Area is related to fruit ripening rate, disease incidence, and ultimately wine quality.
- Currently no efficient way to map leaf area during the growing season.
- Need to obtain *absolute* estimate of leaf area.

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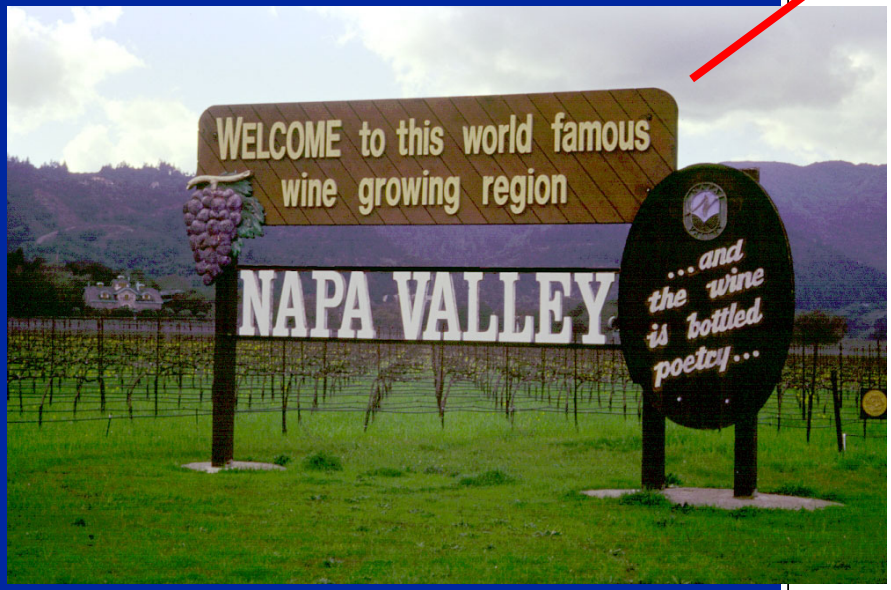
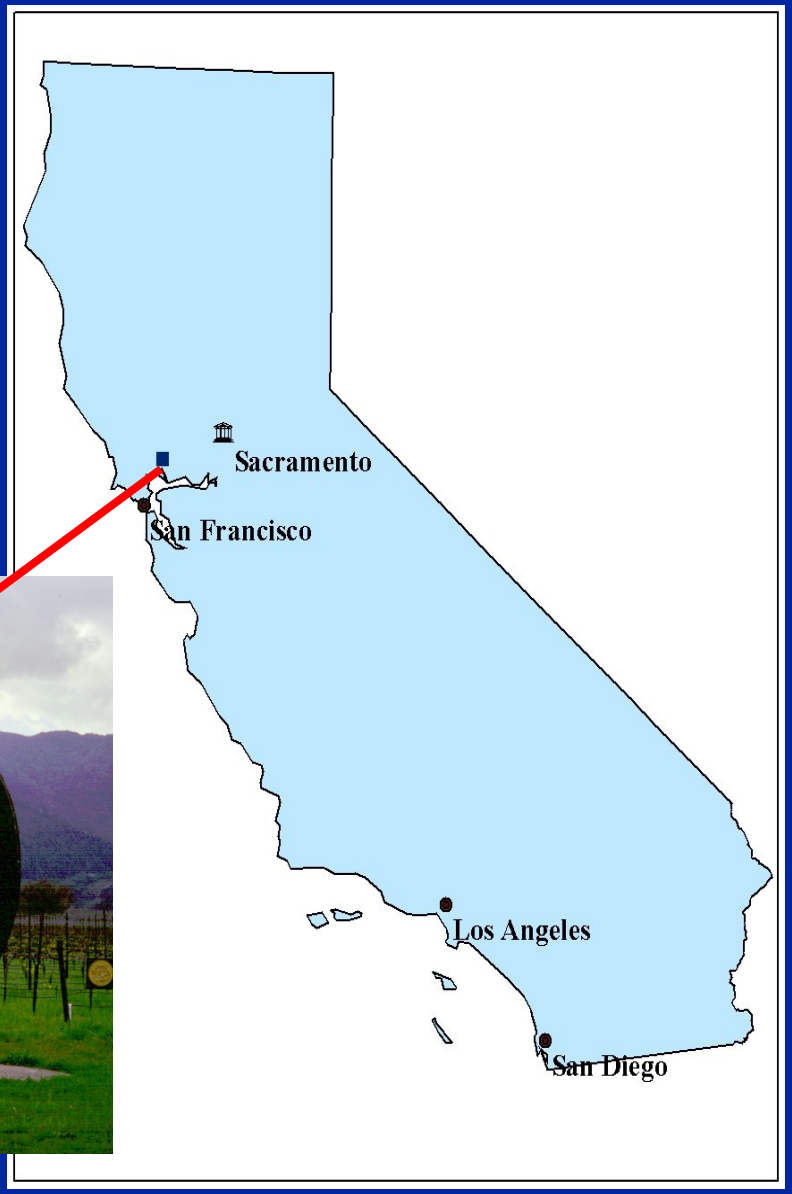
STUDY SITE:

Favorable natural factors and technological innovation combine to make the Napa Valley region the top U.S.A. producer of premium wines.





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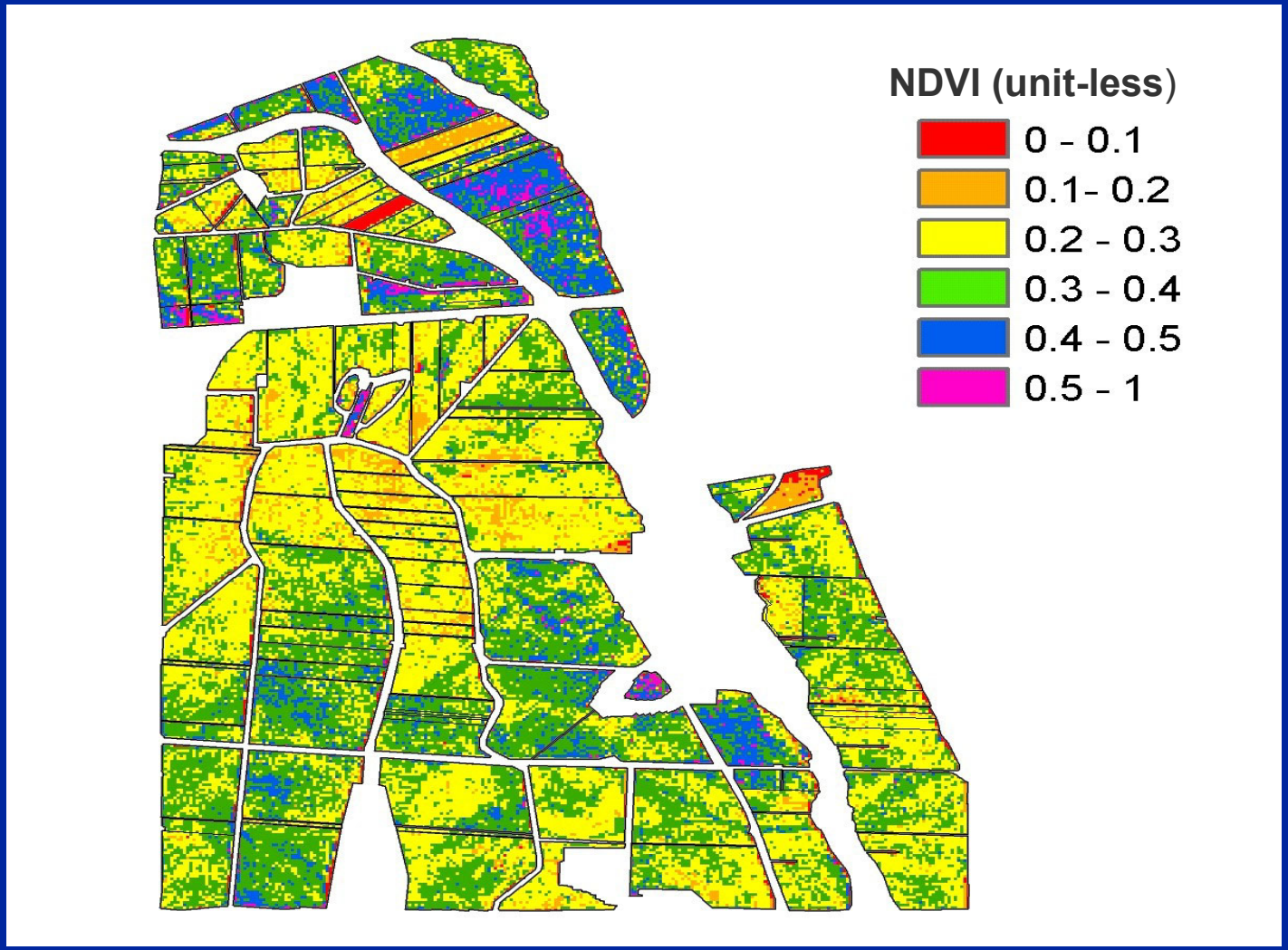
NDVI Calculated for vineyard blocks



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Leaf Area Index estimated using in-field measurement methods

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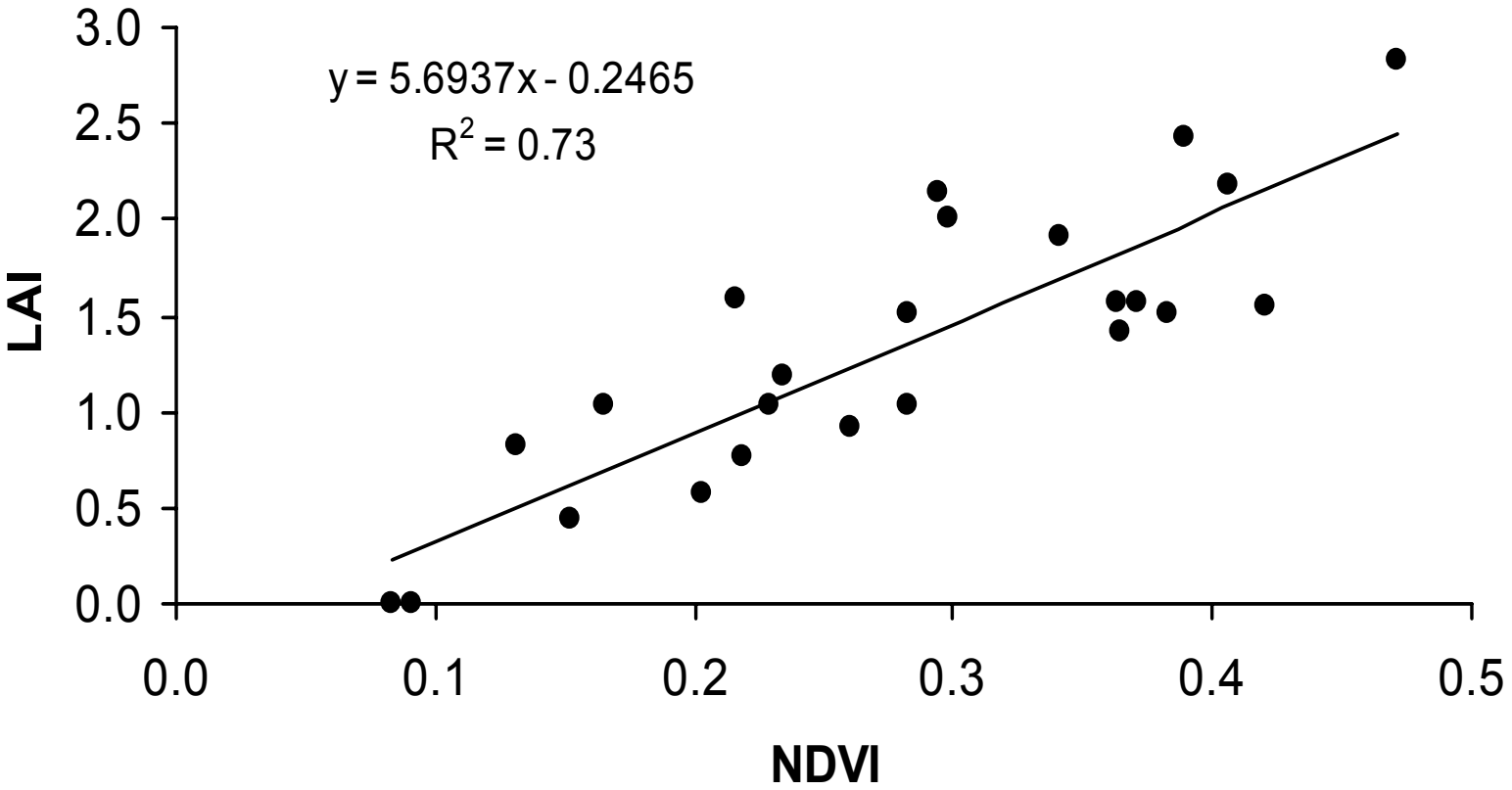
Leaf Area Index measurements compared with per-pixel NDVI values



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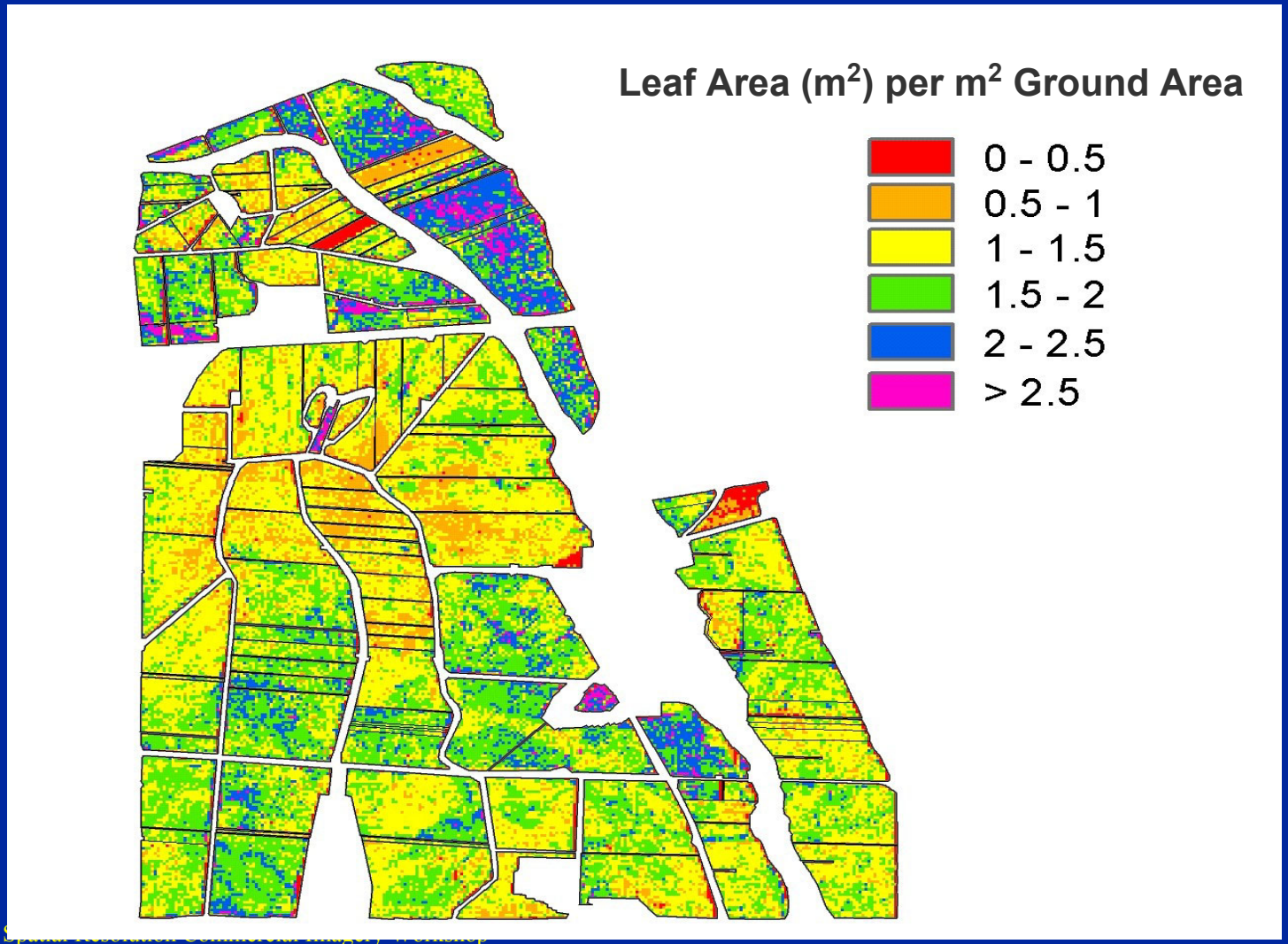
Estimated LAI using NDVI Image



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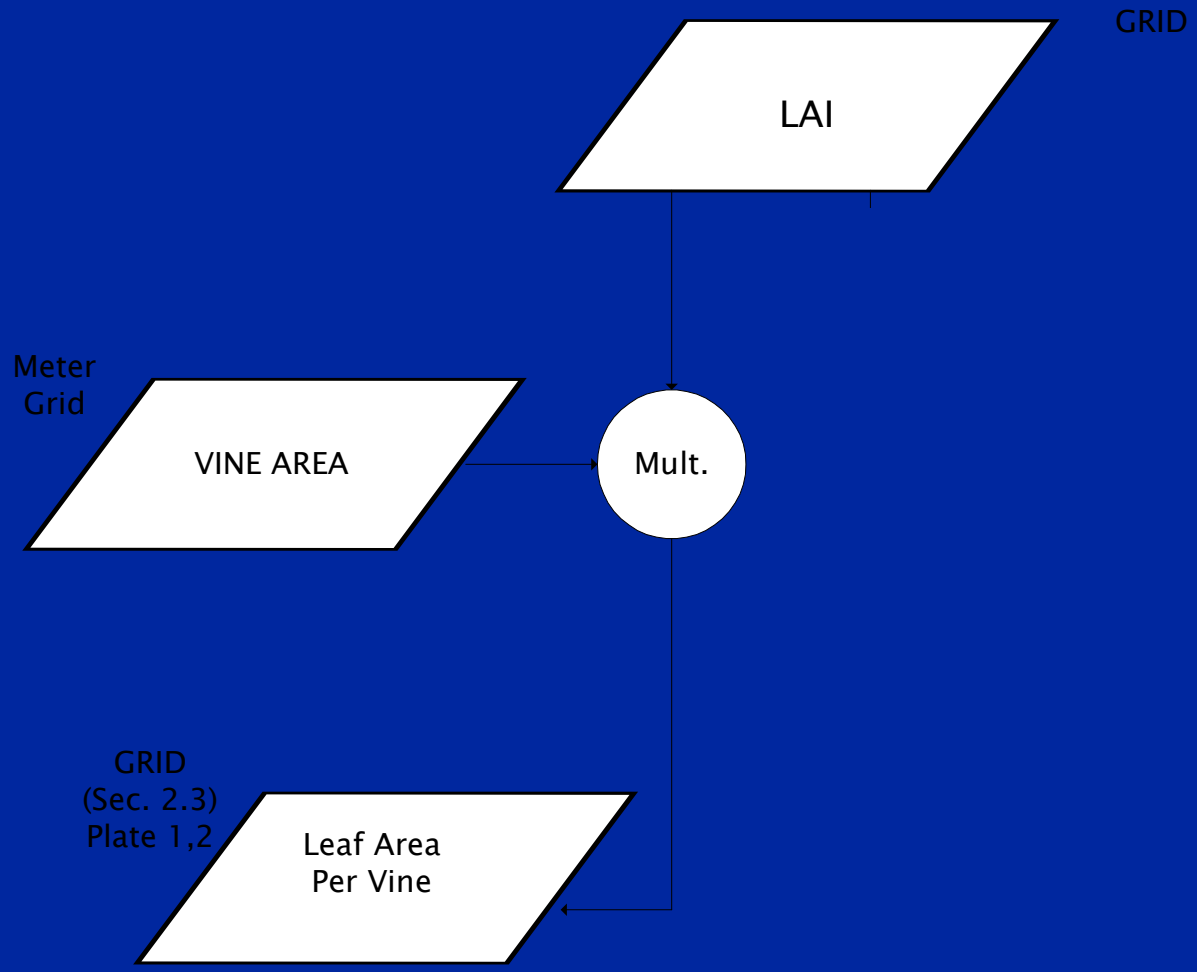
Estimating Leaf Area per Vine using GIS



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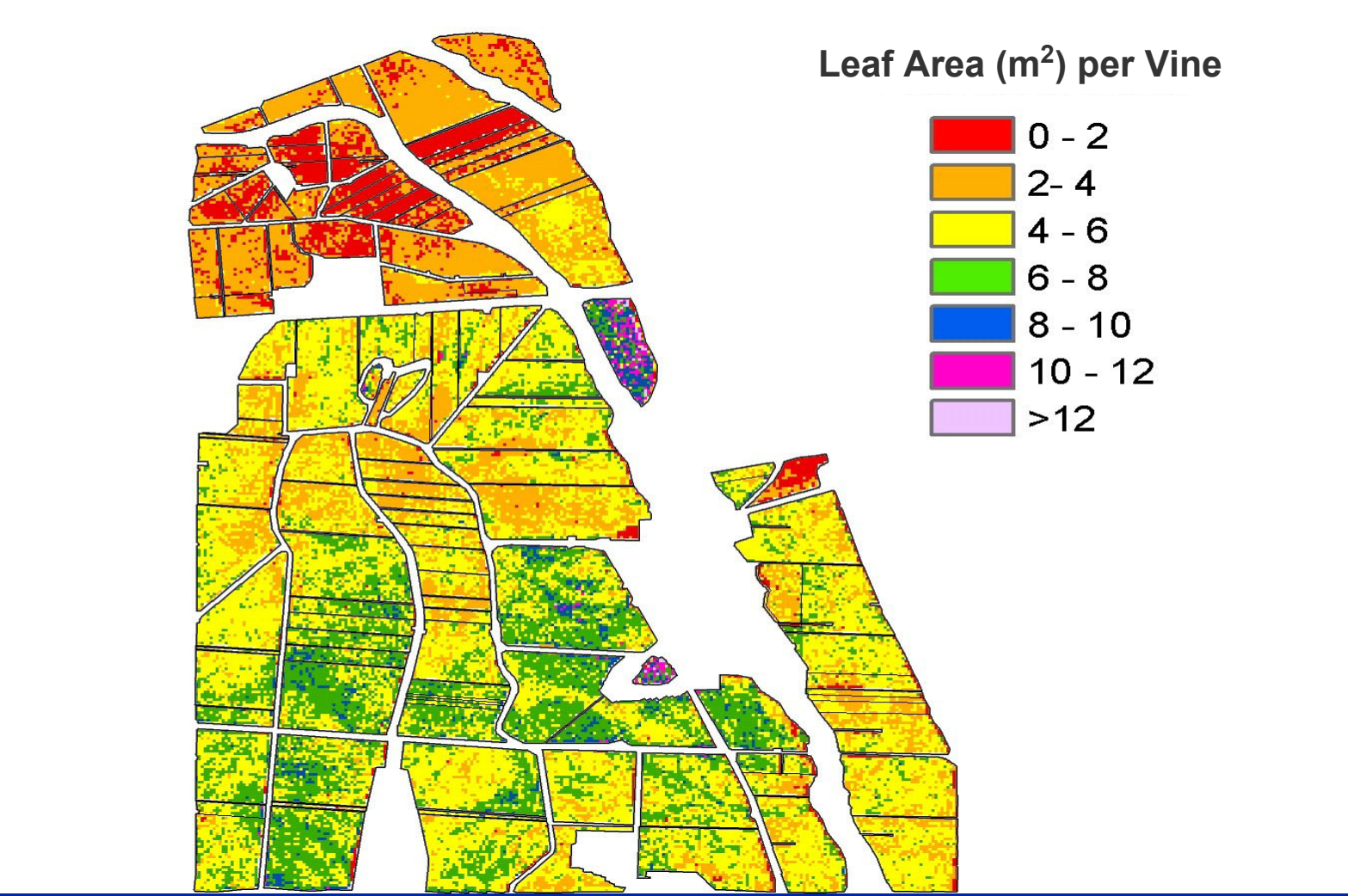
Estimated Leaf Area per Vine using GIS



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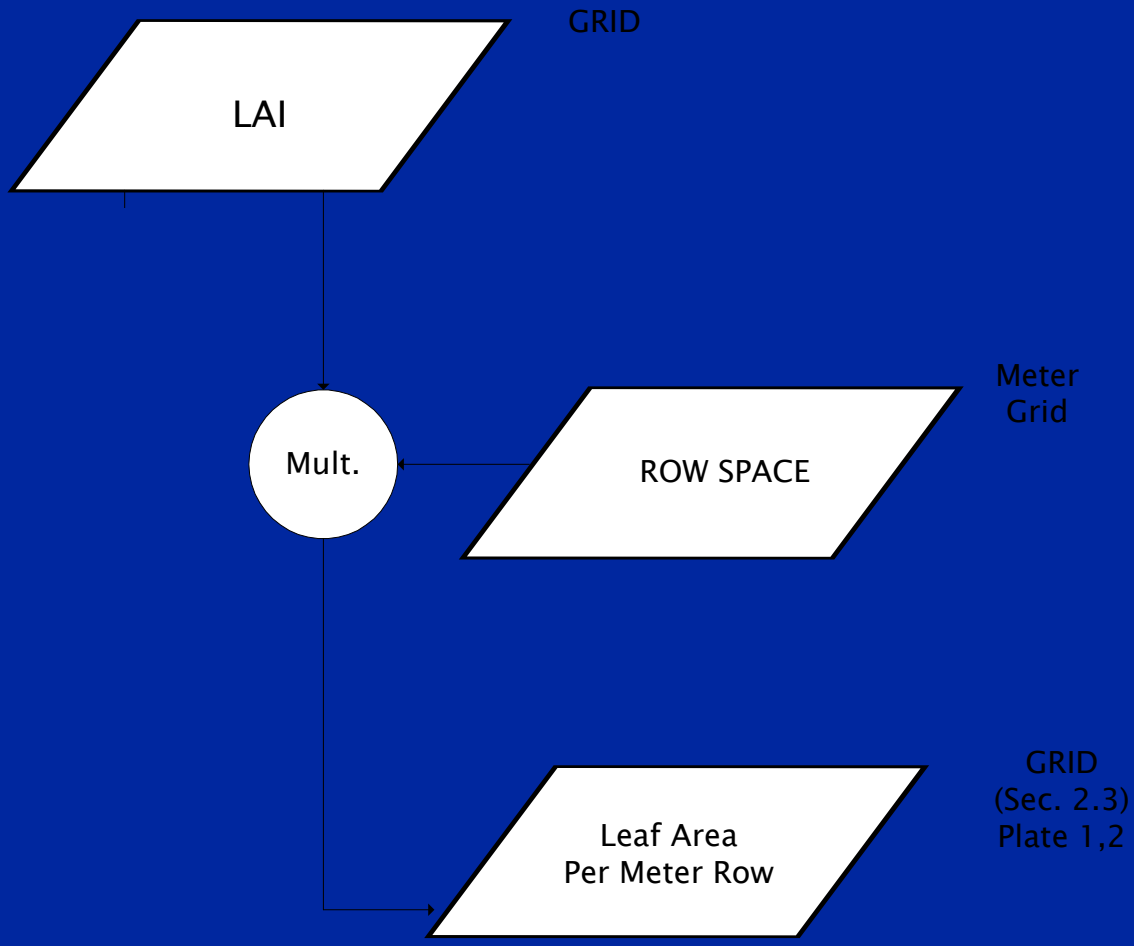
Estimating Leaf Area per Meter Row using GIS



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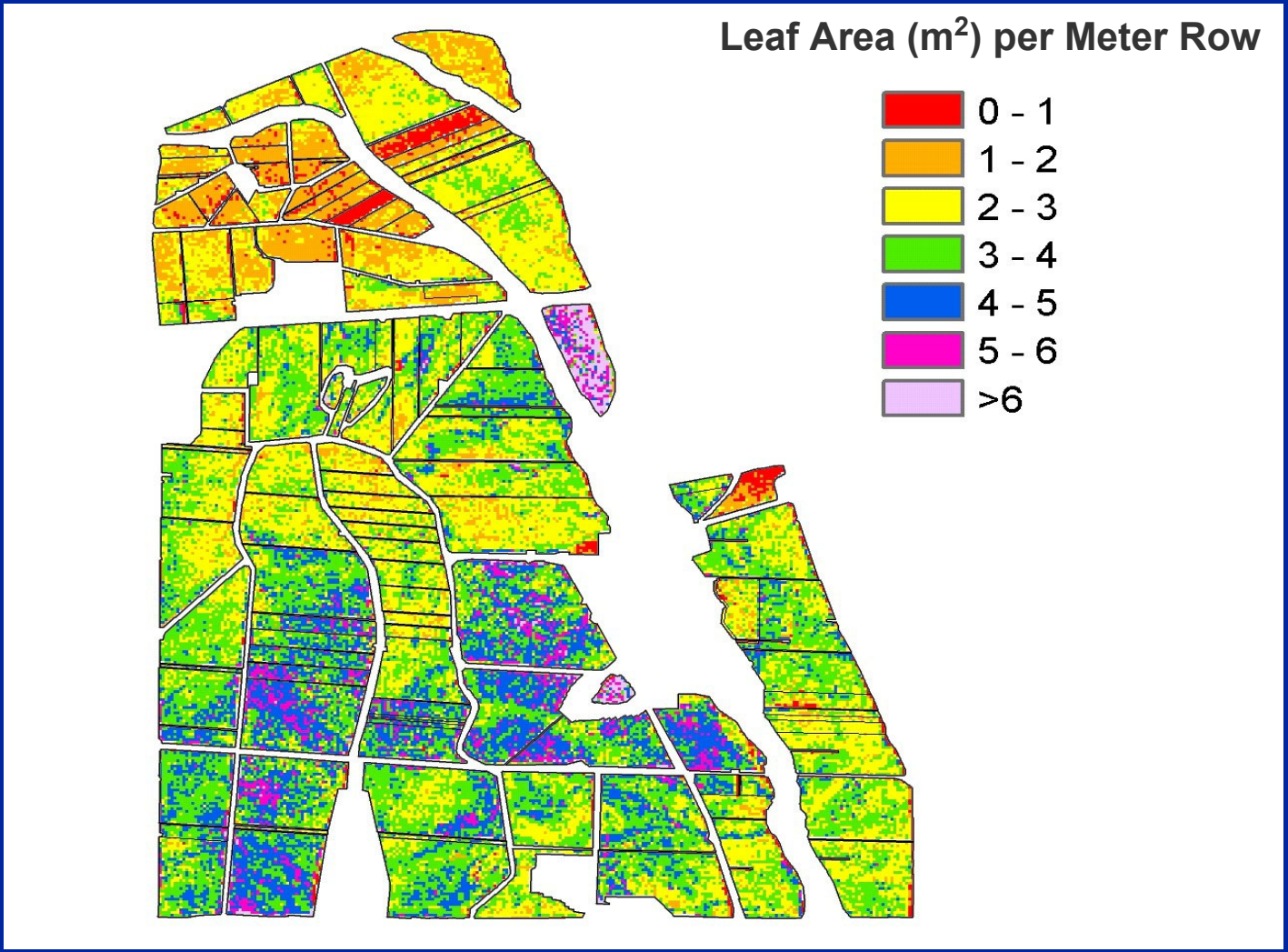
Estimated Leaf Area Meter of Row Mapped



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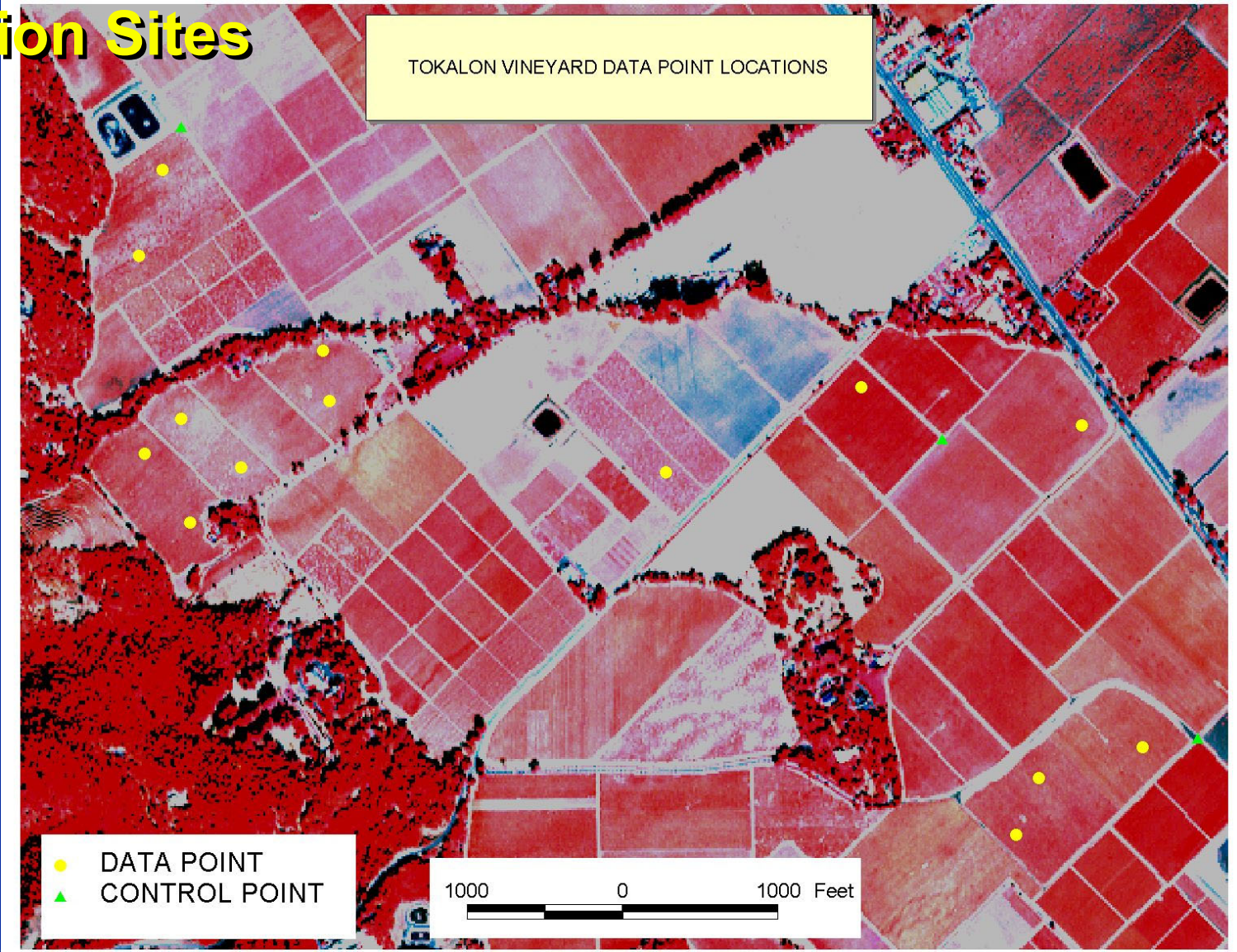
Validation Sites



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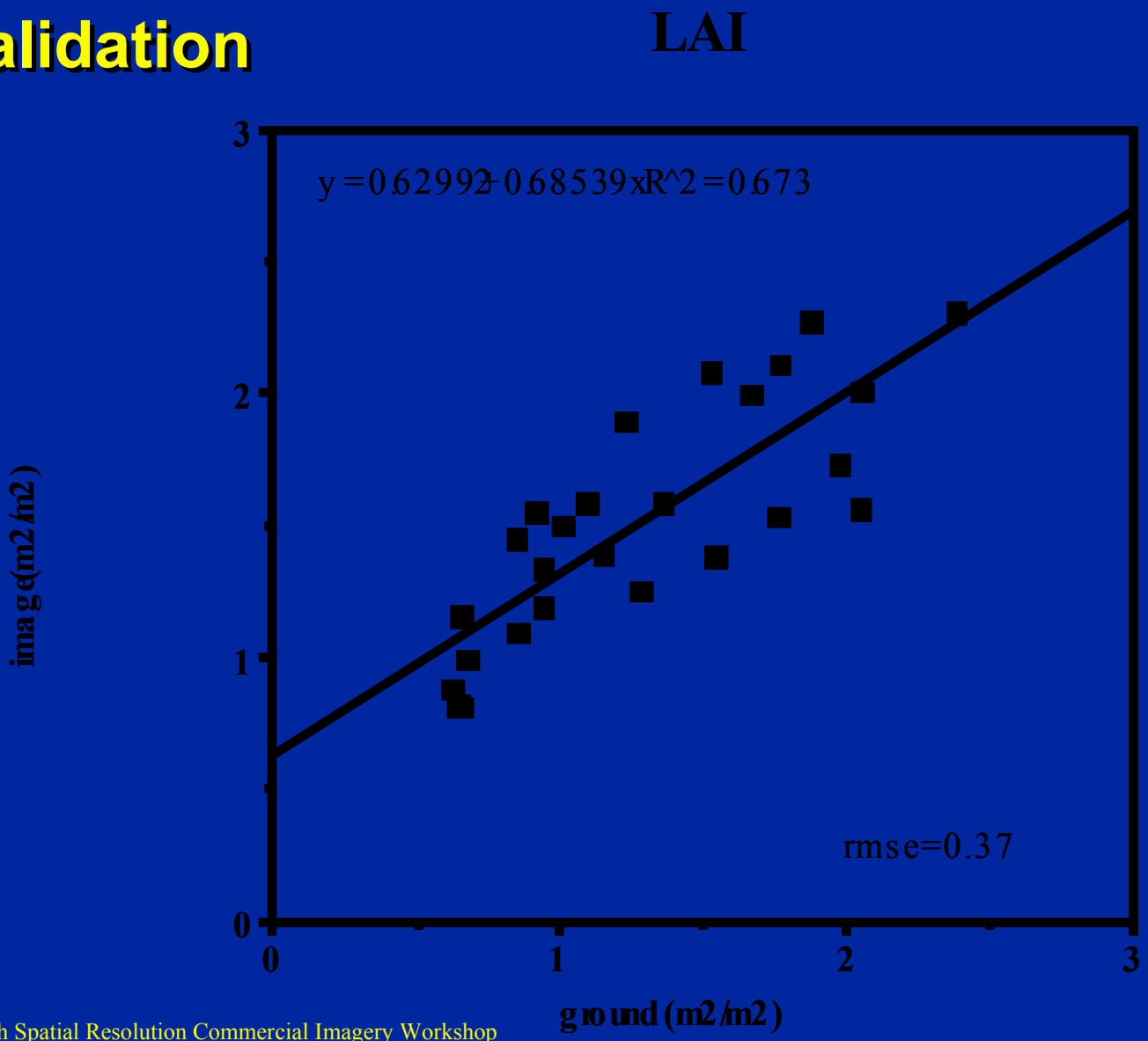
Validation



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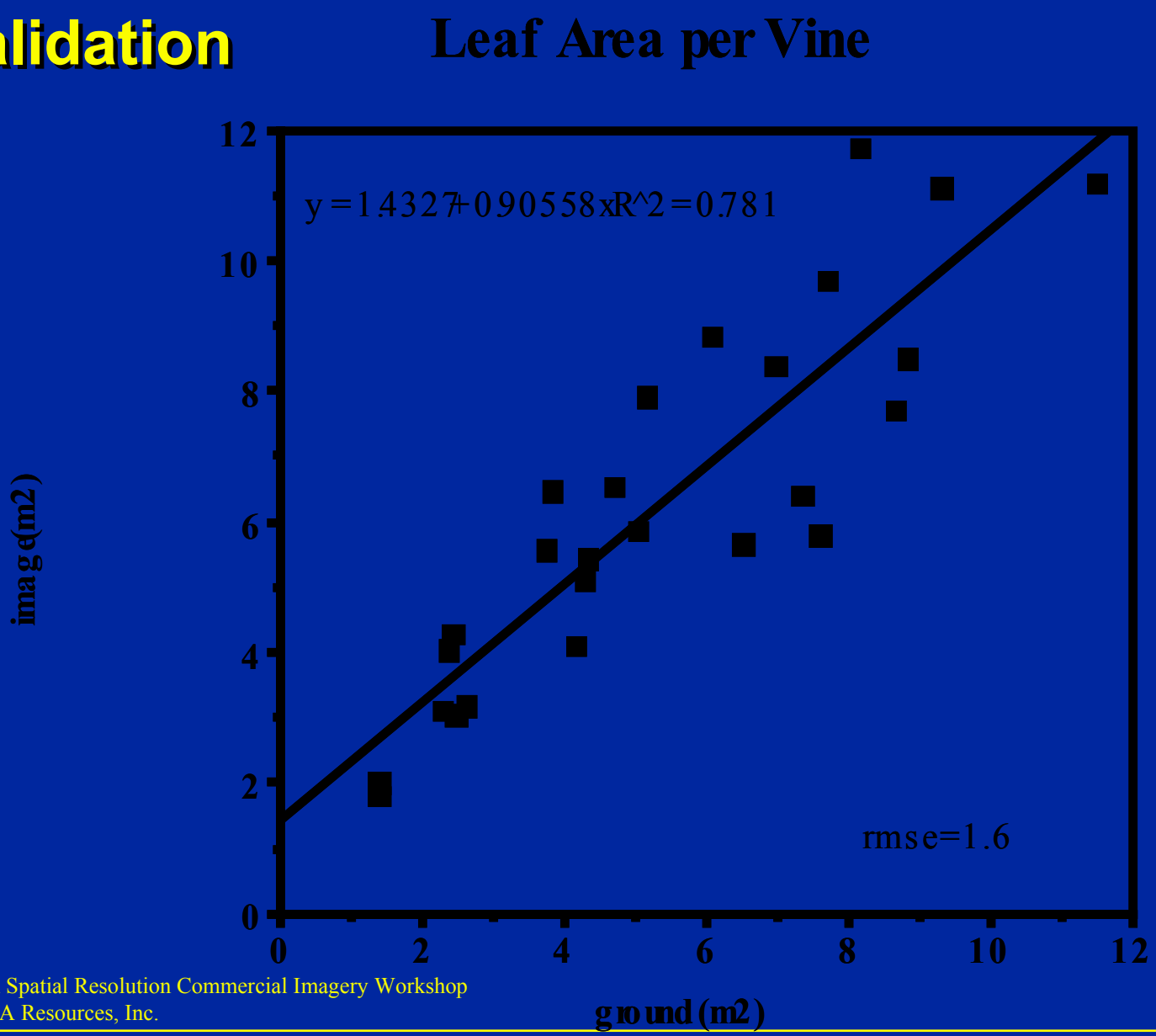
Validation



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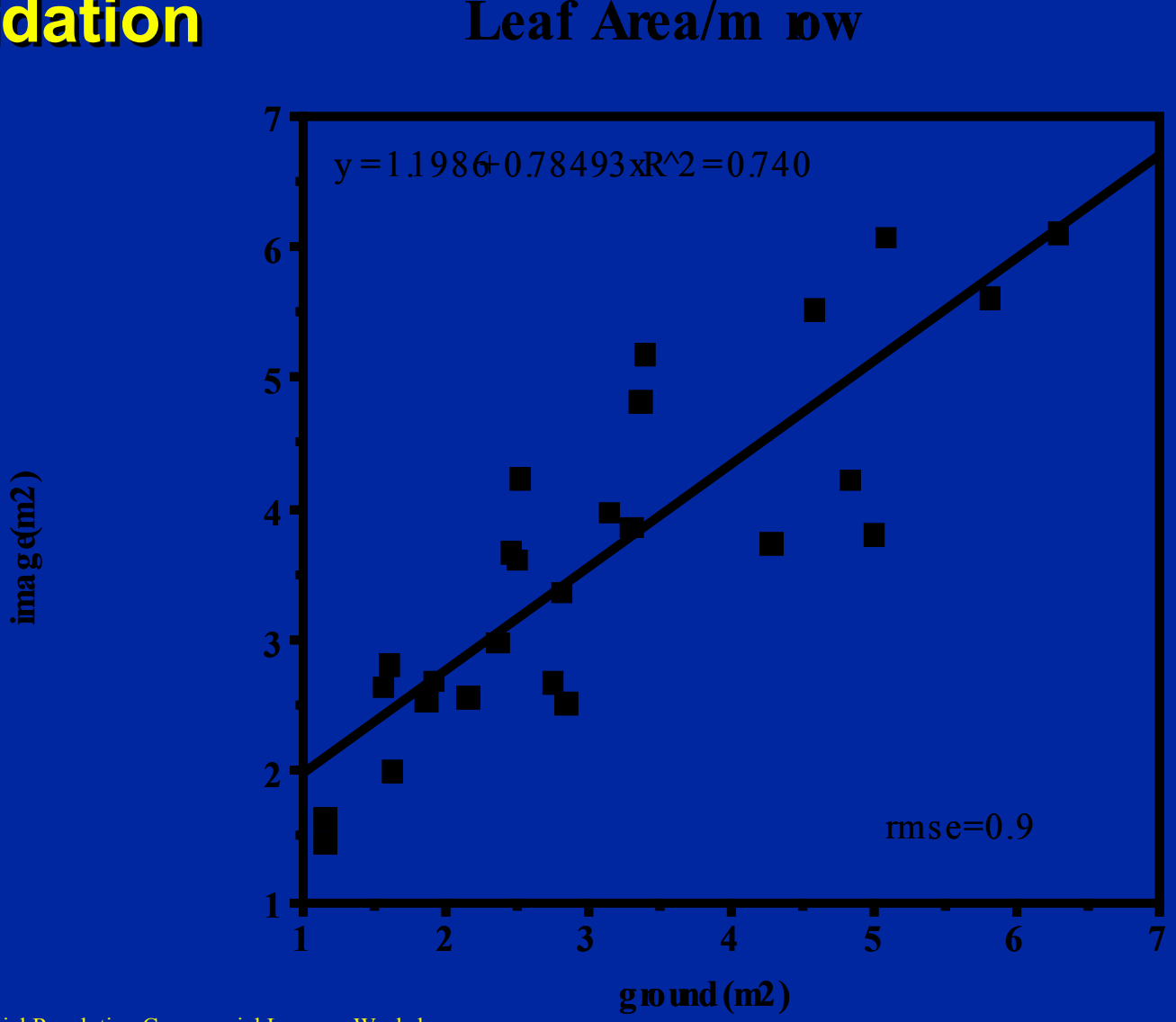
Validation



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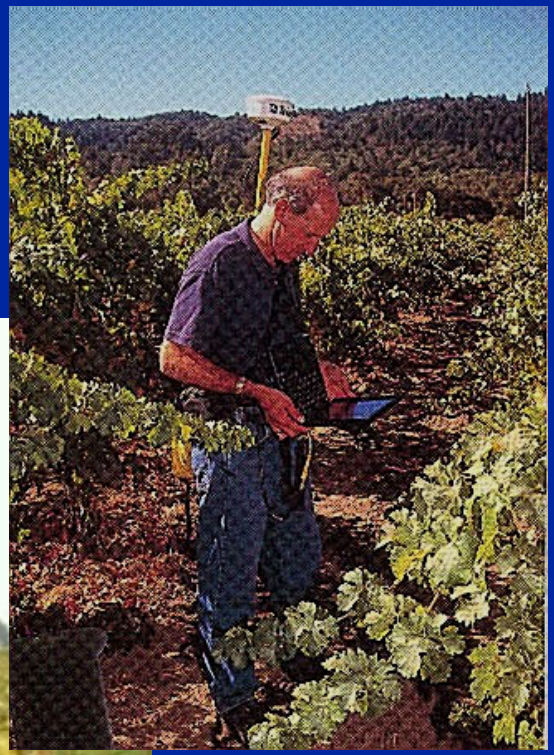
Distributing model results via mobile GIS



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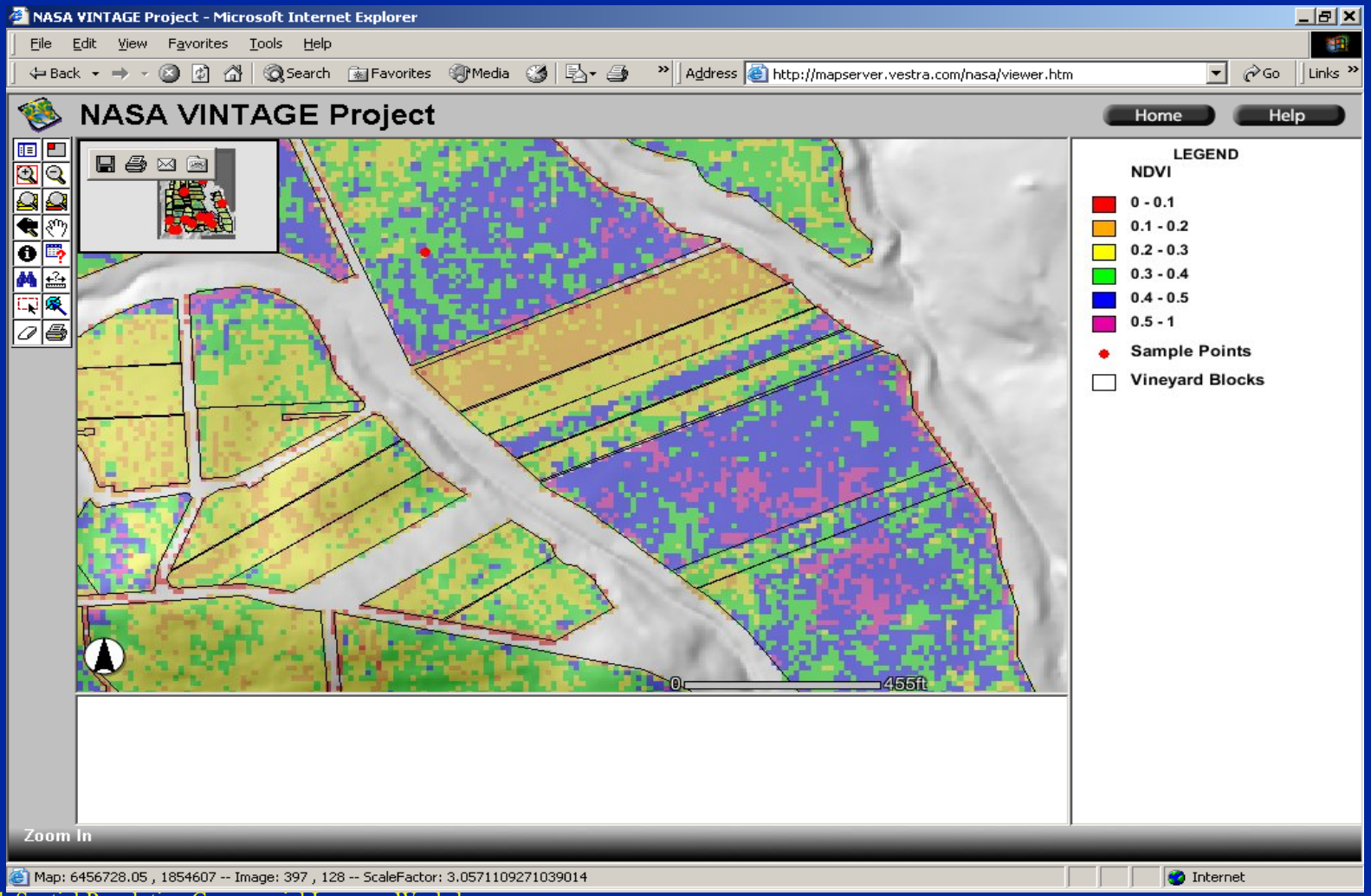
Distributing modeling results via the Internet



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Acknowledgements:

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Daniel Bosch, The Robert Mondavi Winery

Additional Information:

www.vestra.com

http://geo.arc.nasa.gov/sge/vintage/vintage.html